

NON-PUBLIC?: N
ACCESSION #: 9412290214
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Sequoyah Nuclear Plant (SQN), Unit 1 PAGE: 1 OF 5

DOCKET NUMBER: 05000327

TITLE: Turbine and Reactor Trips Caused by Loss of the Turbine
Electrohydraulic Control System Power Supplies
EVENT DATE: 11/29/94 LER #: 94-014-00 REPORT DATE: 12/22/94

OTHER FACILITIES INVOLVED: DOCKET NO: 05000328

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: J. W. Proffitt, Compliance Licensing TELEPHONE: (615) 843-6651

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On November 29, 1994, at 0713 Eastern standard time, with Unit 1 in power operation at approximately 100 percent power, the turbine tripped followed by a reactor trip as a result of the loss of both of the turbine 48-v

lt electrohydraulic control (EHC) power supplies. The cause of the loss of both 48-volt turbine EHC power supplies was attributed to an electrical spike on the power supply output. The power supply output overvoltage protection limiter setting for both power supplies had previously been reduced. The root cause of this event was inadequate technical review in changing the EHC overvoltage trip point. The trip point was changed based upon verbal communication from an onsite vendor representative. A contributing factor to this event was an increase in radio frequency interference resulting in the overvoltage trip point being exceeded, causing the loss of the EHC power supply. The overvoltage trip point was reset to the 10 percent preferred margin before returning

the system to operation. The appropriate plant procedures will be revised to require vendor information, including verbal information, to be evaluated in accordance with the vendor manual program before the information can be utilized.

END OF ABSTRACT

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I. PLANT CONDITIONS

Unit 1 was in Mode 1 at approximately 100 percent power.

II. DESCRIPTION OF EVENT

A. Event

On November 29, 1994, at 0713 Eastern standard time (EST), the turbine tripped followed by a reactor trip as a result of the loss of both of the turbine 48-volt (V) electrohydraulic control (EHC) power supplies (EHS Code RJX). The power supply output overvoltage protection limiter setting for both power supplies had previously been reduced. The change was based upon verbal communication from an onsite vendor representative. Subsequently, plant procedure changes were implemented that changed the preferred margin from 10 percent to 3 percent. For a couple of days before the event, an increase in radio frequency interference was observed in that spiking on the condenser low vacuum recorder was occurring. The increase in radio frequency interference resulted in the overvoltage trip point being exceeded, causing the loss of EHC power supplies.

Further investigation via computer trending indicated no upscale deflection of either of the condenser vacuum computer points before the unit trip. The output indicated by the instrument loop recorders was generated by an interference signal generated from an unknown source. Actual vacuum did not degrade and the turbine trip was not generated from low condenser vacuum, either actual or from an interference signal.

B. Inoperable Structures, Components, or Systems That Contributed to the Event

None.

C. Dates and Approximate Times of Major Occurrences

November 29, 1994 A turbine trip was initiated because of the at 0713 EST loss of EHC power supply. This was based on turbine first out alarm "UNIT 1 EHC POWER FAILURE TURBINE TRIP" being received on the Beta printer. Subsequently, a reactor trip was initiated as a result of the auto stop oil pressure decreasing to square inch gauge.

November 29, 1994 The reactor trip signal initiated on lo lo at 0713 EST levels in the steam generators initiated the starting of the auxiliary feedwater pumps as designed.

November 29, 1994 Operations personnel stabilized the plant in Mode 3 at no load temperature (547 degrees Fahrenheit) and pressure.

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D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The turbine and reactor trips were annunciated on the main control room panels.

F. Operator Actions

Control room personnel responded as prescribed by emergency procedures. They promptly diagnosed the plant condition and took the actions necessary to stabilize the unit in a safe condition and maintained the unit in hot standby, Mode 3.

G. Safety System Responses

The plant responded to the turbine and reactor trips as designed.

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of the event was the loss of both 48-V DC EHC power supplies attributed to an electrical spike on the power supply output.

B. Root Cause

The root cause of this event was an inadequate technical review of changing the EHC overvoltage trip point. The trip point was changed based upon verbal communication from an onsite vendor representative. Changes to the facility (procedure or hardware) are required to have a technical basis. Subsequently, plant procedure changes were implemented that changed the preferred margin from 10 percent to 3 percent.

C. Contributing Factors

A contributing factor to this event was an increase in radio frequency interference resulting in the overvoltage trip point being exceeded, causing the loss of EHC power supply. For a couple of days before the event, spiking on the low vacuum recorder was occurring. Immediately before the trip, a condenser low vacuum alarm annunciated in the control room. Further investigation via computer trending indicated no upscale deflection of either of the condenser vacuum computer points before the unit trip. The output indicated by the instrument loops was generated by an interference signal from an unknown source. Actual vacuum did not degrade, and the turbine trip was not generated from low vacuum either actual or from an interference signal.

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IV. ANALYSIS OF EVENT

Plant responses during and after the unit trip were consistent with responses described in the final safety analysis report and accordingly, the event did not adversely affect the health and safety of plant personnel or the general public.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

Control room personnel responded as prescribed by emergency procedures. They promptly diagnosed the plant condition and took the action necessary to stabilize the unit in a safe

condition. The EHC overvoltage trip point was reset to the 10 percent preferred margin before returning the EHC system to operation. The overvoltage trip point on Unit 2 was also increased. Radio frequency interference choking devices have been installed on each unit's EHC system to reduce the potential of a radio frequency interference, causing a loss of the EHC power supply.

B. Corrective Action to Prevent Recurrence

As an interim measure, Maintenance management has been directed not to implement verbal vendor recommendations outside the vendor manual change process.

The appropriate plant procedures will be revised to require vendor information, including verbal information, to be evaluated in accordance with the vendor manual program before the information can be utilized.

As a result of the increased radio frequency interference, a problem evaluation report was initiated to identify and correct the source of the condition.

VI. ADDITIONAL INFORMATION

A. Failed Components

No immediate posttrip abnormalities were identified. However, approximately three hours after the plant had been stabilized, a crack was identified on the condensate system. Appropriate evaluation of the condition and repairs were performed.

B. Previous Similar Events

A review of previous events identified no similar events that resulted in a reactor trip that resulted from loss of both 48-V DC EHC power supplies. One LER (327/91009) was identified that was associated with the inadequate evaluation of vendor information. These events are similar in that

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vendor information was utilized to change hardware in the plant. However, the corrective actions for the previous event were directed at not relying solely on vendor information when performing an engineering evaluation. In this event, an

engineering evaluation was not performed for the vendor's verbal information.

VII. COMMITMENT

The appropriate plant procedures will be revised by February 10, 1995, to require vendor information, including verbal information, to be evaluated in accordance with the vendor manual program before the information can be utilized.

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TVA

Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379

December 22, 1994

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1
DOCKET NO.
50-327 - FACILITY OPERATING LICENSE DPR-77 - LICENSEE EVENT REPORT (LER)
50-327/94014

The enclosed LER provides details concerning an automatic turbine and reactor trip resulting from a loss of the turbine electrohydraulic control system power supply. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv) as an event that resulted in the automatic actuation of engineered safety features, including the reactor protection system.

Sincerely,

R. J. Adney
Site Vice President

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

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December 22, 1994

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